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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Robertson *et al.*
Serial No.: 09/903,410
Filed: July 10, 2001
Title: ENZYMES HAVING ESTERASE ACTIVITY AND METHODS OF USE
THEREOF

Art Unit: Unassigned
Examiner: Unassigned

Commissioner for Patents
Washington, D.C. 20231

VERIFIED STATEMENT UNDER 37 C.F.R. § 1.821(f)

Sir:

I, Mikhail Bayley, declare that I personally prepared the paper and the computer-readable copies of the Sequence Listing filed herewith in the above-entitled case and that the content of both is the same.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of The United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 09/24/2001

Mikhail Bayley
Mikhail Bayley

GRAY CARY WARE & FREIDENRICH LLP
4365 Executive Drive, Suite 1600
San Diego, CA 92121-2189

Customer Number: 28213

CERTIFICATION UNDER 37 CFR §1.8	
I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date, <u>Dec 10, 2001</u> , in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231.	
<u>Stephanie Sharrett</u>	
Name of Person Mailing Paper	
<u>Stephanie Sharrett</u>	<u>12/10/01</u>
Signature	Date



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Commissioner for Patents
 Washington, D.C. 20231

STATEMENT UNDER 37 C.F.R. §§ 1.821(f) and (g)

Sir:

I hereby state, as required by 37 C.F.R. § 1.821(f), that the information recorded in computer readable form is identical to the written sequence listing.

I hereby state that the submission, filed in accordance with 37 C.F.R. § 1.821 (g), herein does not include new matter.

Respectfully submitted,

Date: 12/10/01

Lisa A. Haile

Lisa A. Haile, Ph.D.

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<u>Stephanie Sharrett</u>	
Name of Person Mailing Paper	
<u>Stephanie Sharrett</u>	
Signature	Date



SEQUENCE LISTING

<100> DIVERSA CORPORATION
ROBERTSON, Dan
MURPHY, Dennis
REID, John
MAFFIA, Anthony
LINK, Steven
SWANSON, Ronald
WARREN, Patrick
KOSMOTKA, Anna

<120> ENZYMES HAVING ESTERASE ACTIVITY AND METHODS OF USE THEREOF

<130> DIVER1180-2

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<141> 2001-07-10

<150> US 09/382,242

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35 40 45
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50 55 60
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 Arg Val Lys Gly Ser Leu Ile Ile Ser Met Gly Val Phe Leu Asn Leu
 85 90 95
 Ile Gly Val Phe Asp Glu Val Tyr Gly Trp Ile His Phe Leu Val Ser
 100 105 110
 Val Leu Phe Phe Leu Ser Ile Ile Ala Tyr Phe Ile Ala Ile Ser Ile
 115 120 125
 Leu Asp Lys Ser Trp Ile Ala Val Leu Leu Ile Ile Gly His Ile Ala
 130 135 140
 Met Trp Tyr Leu His Phe Ala Ser Glu Ile Pro Arg Gly Ala Ala Ile
 145 150 155 160
 Pro Glu Leu Leu Ala Val Phe Ser Phe Leu Pro Phe Tyr Ile Arg Asp
 165 170 175
 Tyr Phe Lys Ser Tyr Thr Lys Arg
 180

 <210> 34
 <211> 346
 <212> PRT
 <213> Pyrodictium

 <400> 34

 Met Lys Leu Leu Glu Pro Thr Asn Thr Ser Tyr Thr Leu Leu Gln Asp
 1 5 10 15
 Leu Ala Leu His Phe Ala Phe Tyr Trp Phe Leu Ala Val Tyr Thr Trp
 20 25 30
 Leu Pro Gly Val Leu Val Arg Gly Val Ala Val Asp Thr Gly Val Ala
 35 40 45
 Arg Val Pro Gly Leu Gly Arg Arg Gly Lys Arg Leu Leu Leu Ala Ala
 50 55 60
 Val Ala Val Leu Ala Leu Val Val Ser Val Val Val Pro Ala Tyr Val
 65 70 75 80
 Ala Tyr Ser Ser Leu His Pro Glu Ser Cys Arg Pro Val Ala Pro Glu
 85 90 95
 Gly Leu Thr Tyr Lys Glu Phe Ser Val Thr Ala Glu Asp Gly Leu Val
 100 105 110
 Val Arg Gly Trp Val Leu Gly Pro Gly Ala Gly Gly Asn Pro Val Phe
 115 120 125
 Val Leu Met His Gly Tyr Thr Gly Cys Arg Ser Ala Pro Tyr Met Ala
 130 135 140
 Val Leu Ala Arg Glu Leu Val Glu Trp Gly Tyr Pro Val Val Val Phe

145				150				155				160			
Asp	Phe	Arg	Gly	His	Gly	Glu	Ser	Gly	Gly	Ser	Thr	Thr	Ile	Gly	Pro
				165				170				175			
Arg	Glu	Val	Leu	Asp	Ala	Arg	Ala	Val	Val	Gly	Tyr	Val	Ser	Glu	Arg
				180				185				190			
Phe	Pro	Gly	Arg	Arg	Ile	Ile	Leu	Val	Gly	Phe	Ser	Met	Gly	Gly	Ala
				195				200				205			
Val	Ala	Ile	Val	Glu	Gly	Ala	Gly	Asp	Pro	Arg	Val	Tyr	Ala	Val	Ala
				210				215				220			
Ala	Asp	Ser	Pro	Tyr	Tyr	Arg	Leu	Arg	Asp	Val	Ile	Pro	Arg	Trp	Leu
225				230				235				240			
Glu	Tyr	Lys	Thr	Pro	Leu	Pro	Gly	Trp	Val	Gly	Val	Leu	Ala	Gly	Phe
				245				250				255			
Tyr	Gly	Arg	Leu	Met	Ala	Gly	Val	Asp	Leu	Gly	Phe	Gly	Pro	Ala	Gly
				260				265				270			
Val	Glu	Arg	Val	Asp	Lys	Pro	Leu	Leu	Val	Val	Tyr	Gly	Pro	Arg	Asp
				275				280				285			
Pro	Leu	Val	Thr	Arg	Asp	Glu	Ala	Arg	Ser	Leu	Ala	Ser	Arg	Ser	Pro
				290				295				300			
Cys	Gly	Arg	Leu	Val	Glu	Val	Pro	Gly	Ala	Gly	His	Val	Glu	Ala	Val
305				310				315				320			
Asp	Val	Leu	Gly	Pro	Gly	Arg	Tyr	Ala	Asp	Met	Leu	Ile	Glu	Leu	Ala
				325				330				335			
His	Glu	Glu	Cys	Pro	Pro	Gly	Ala	Gly	Gly						
				340				345							

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<210> 35
<211> 262
<212> PRT
<213> Archaeoglobus Veneficus
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<400> 35

Met	Pro	Tyr	Val	Arg	Asn	Gly	Gly	Val	Asn	Ile	Tyr	Tyr	Glu	Leu	Val
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Asp	Gly	Pro	Glu	Pro	Pro	Ile	Val	Phe	Val	His	Gly	Trp	Thr	Ala	Asn
			20					25					30		
Met	Asn	Phe	Trp	Lys	Glu	Gln	Arg	Arg	Tyr	Phe	Ala	Gly	Arg	Asn	Met
		35					40					45			
Met	Leu	Phe	Val	Asp	Asn	Arg	Gly	His	Gly	Arg	Ser	Asp	Lys	Pro	Leu
	50					55					60				
Gly	Tyr	Asp	Phe	Tyr	Arg	Phe	Glu	Asn	Phe	Ile	Ser	Asp	Leu	Asp	Ala
65					70					75					80
Val	Val	Arg	Glu	Thr	Gly	Val	Glu	Lys	Phe	Val	Leu	Val	Gly	His	Ser

				85					90					95			
Phe	Gly	Thr	Met	Ile	Ser	Met	Lys	Tyr	Cys	Ser	Glu	Tyr	Arg	Asn	Arg		
			100					105					110				
Val	Leu	Ala	Leu	Ile	Leu	Ile	Gly	Gly	Gly	Ser	Arg	Ile	Lys	Leu	Leu		
		115					120					125					
His	Arg	Ile	Gly	Tyr	Pro	Leu	Ala	Lys	Ile	Leu	Ala	Ser	Ile	Ala	Tyr		
	130					135					140						
Lys	Lys	Ser	Ser	Arg	Leu	Val	Ala	Asp	Leu	Ser	Phe	Gly	Lys	Asn	Ala		
145					150					155					160		
Gly	Glu	Leu	Lys	Glu	Trp	Gly	Trp	Lys	Gln	Ala	Met	Asp	Tyr	Thr	Pro		
				165					170					175			
Ser	Tyr	Val	Ala	Met	Tyr	Thr	Tyr	Arg	Thr	Leu	Thr	Lys	Val	Asn	Leu		
			180					185					190				
Glu	Asn	Ile	Leu	Glu	Lys	Ile	Asp	Cys	Pro	Thr	Leu	Ile	Ile	Val	Gly		
		195					200					205					
Glu	Glu	Asp	Ala	Leu	Leu	Pro	Val	Ser	Lys	Ser	Val	Glu	Leu	Ser	Arg		
	210					215					220						
Arg	Ile	Glu	Asn	Ser	Lys	Leu	Val	Ile	Ile	Pro	Asn	Ser	Gly	His	Cys		
225					230					235					240		
Val	Met	Leu	Glu	Ser	Pro	Ser	Glu	Val	Asn	Arg	Ala	Met	Asp	Glu	Phe		
				245					250					255			
Ile	Ser	Ser	Ala	Gln	Phe												
			260														
<210>	36																
<211>	251																
<212>	PRT																
<213>	Aquifex pyrophilus																
<400>	36																
Leu	Arg	Leu	Arg	Lys	Phe	Glu	Glu	Ile	Asn	Leu	Val	Leu	Ser	Gly	Gly		
1				5					10					15			
Ala	Ala	Lys	Gly	Ile	Ala	His	Ile	Gly	Val	Leu	Lys	Ala	Ile	Asn	Glu		
			20					25					30				
Leu	Gly	Ile	Arg	Val	Arg	Ala	Leu	Ser	Gly	Val	Ser	Ala	Gly	Ala	Ile		
		35					40					45					
Val	Ser	Val	Phe	Tyr	Ala	Ser	Gly	Tyr	Ser	Pro	Glu	Gly	Met	Phe	Ser		
	50					55					60						
Leu	Leu	Lys	Arg	Val	Asn	Trp	Leu	Lys	Leu	Phe	Lys	Phe	Lys	Pro	Pro		
65					70					75					80		
Leu	Lys	Gly	Leu	Ile	Gly	Trp	Glu	Lys	Ala	Ile	Arg	Phe	Leu	Glu	Glu		
				85					90					95			
Val	Leu	Pro	Tyr	Arg	Arg	Ile	Glu	Lys	Leu	Glu	Ile	Pro	Thr	Tyr	Ile		

100					105					110							
Cys	Ala	Thr	Asp	Leu	Tyr	Ser	Gly	Arg	Ala	Leu	Tyr	Leu	Ser	Glu	Gly		
115					120					125							
Ser	Leu	Ile	Pro	Ala	Leu	Leu	Gly	Ser	Cys	Ala	Ile	Pro	Gly	Ile	Phe		
130					135					140							
Glu	Pro	Val	Glu	Tyr	Lys	Asn	Tyr	Leu	Leu	Val	Asp	Gly	Gly	Ile	Val		
145					150					155					160		
Asn	Asn	Leu	Pro	Val	Glu	Pro	Phe	Gln	Glu	Ser	Gly	Ile	Pro	Thr	Val		
165					170					175							
Cys	Val	Asp	Val	Leu	Pro	Ile	Glu	Pro	Glu	Lys	Asp	Ile	Lys	Asn	Ile		
180					185					190							
Leu	His	Ile	Leu	Leu	Arg	Ser	Phe	Phe	Leu	Ala	Val	Arg	Ser	Asn	Ser		
195					200					205							
Glu	Lys	Arg	Lys	Glu	Phe	Cys	Asp	Leu	Val	Ile	Val	Pro	Glu	Leu	Glu		
210					215					220							
Glu	Phe	Thr	Pro	Leu	Asp	Val	Arg	Lys	Ala	Asp	Gln	Ile	Met	Glu	Arg		
225					230					235					240		
Gly	Tyr	Ile	Lys	Ala	Leu	Glu	Val	Leu	Ser	Glu							
245					250												

<210> 37
 <211> 297
 <212> PRT
 <213> M11TL-29L

<400> 37

Met	Phe	Asn	Ile	Asn	Val	Phe	Val	Asn	Ile	Ser	Trp	Leu	Tyr	Phe	Ser
1				5					10					15	
Gly	Ile	Val	Met	Lys	Thr	Val	Glu	Glu	Tyr	Ala	Leu	Leu	Glu	Thr	Gly
			20					25					30		
Val	Arg	Val	Phe	Tyr	Arg	Cys	Val	Ile	Pro	Glu	Lys	Ala	Phe	Asn	Thr
			35				40						45		
Leu	Ile	Ile	Gly	Ser	His	Gly	Leu	Gly	Ala	His	Ser	Gly	Ile	Tyr	Ile
			50			55						60			
Ser	Val	Ala	Glu	Glu	Phe	Ala	Arg	His	Gly	Phe	Gly	Phe	Cys	Met	His
65					70				75					80	
Asp	Gln	Arg	Gly	His	Gly	Arg	Thr	Ala	Ser	Asp	Arg	Glu	Arg	Gly	Tyr
				85					90					95	
Val	Glu	Gly	Phe	His	Asn	Phe	Ile	Glu	Asp	Met	Lys	Ala	Phe	Ser	Asp
			100					105					110		
Tyr	Ala	Lys	Trp	Arg	Val	Gly	Gly	Asp	Glu	Ile	Ile	Leu	Leu	Gly	His
			115				120					125			
Ser	Met	Gly	Gly	Leu	Ile	Ala	Leu	Leu	Thr	Val	Ala	Thr	Tyr	Lys	Glu

130	135	140
Ile Ala Lys Gly Val	Ile Ala Leu Ala Pro	Ala Leu Gln Ile Pro Leu
145	150	155 160
Thr Pro Ala Arg Arg	Leu Val Leu Ser Leu	Ala Ser Arg Leu Ala Pro
	165	170 175
His Ser Lys Ile Thr	Leu Gln Arg Arg	Leu Pro Gln Lys Pro Glu Gly
	180	185 190
Phe Gln Arg Ala Lys	Asp Ile Glu Tyr Ser	Leu Ser Glu Ile Ser Val
	195	200 205
Lys Leu Val Asp Glu	Met Ile Lys Ala Ser	Ser Met Phe Trp Thr Ile
	210	215 220
Ala Gly Glu Ile Asn	Thr Pro Val Leu Leu	Ile His Gly Glu Lys Asp
	225	230 235 240
Asn Val Ile Pro Pro	Glu Ala Ser Lys Lys	Ala Tyr Gln Leu Ile Pro
	245	250 255
Ser Phe Pro Lys Glu	Leu Lys Ile Tyr Pro	Asp Leu Gly His Asn Leu
	260	265 270
Phe Phe Glu Pro Gly	Ala Val Lys Ile Val	Thr Asp Ile Val Glu Trp
	275	280 285
Val Lys Asn Leu Pro	Arg Glu Asn Pro	
	290	295
<210>	38	
<211>	262	
<212>	PRT	
<213>	Thermococcus CL-2-30LC	
<400>	38	
Met Glu Val Tyr Lys	Ala Lys Phe Gly	Glu Ala Lys Leu Gly Trp Val
1	5	10 15
Val Leu Val His Gly	Leu Gly Glu His	Ser Gly Arg Tyr Gly Arg Leu
	20	25 30
Ile Lys Glu Leu Asn	Tyr Ala Gly Phe	Gly Val Tyr Thr Phe Asp Trp
	35	40 45
Pro Gly His Gly Lys	Ser Pro Gly Lys Arg	Gly His Thr Ser Val Glu
	50	55 60
Glu Ala Met Glu Ile	Ile Asp Ser Ile Ile	Glu Glu Ile Arg Glu Lys
	65	70 75 80
Pro Phe Leu Phe Gly	His Ser Leu Gly	Gly Leu Thr Val Ile Arg Tyr
	85	90 95
Ala Glu Thr Arg Pro	Asp Lys Ile Arg	Gly Leu Ile Ala Ser Ser Pro
	100	105 110
Ala Leu Ala Lys Ser	Pro Glu Thr Pro	Gly Phe Met Val Ala Leu Ala

115					120					125					
Lys	Phe	Leu	Gly	Lys	Ile	Ala	Pro	Gly	Val	Val	Leu	Ser	Asn	Gly	Ile
130					135					140					
Lys	Pro	Glu	Leu	Leu	Ser	Arg	Asn	Arg	Asp	Ala	Val	Arg	Arg	Tyr	Val
145					150					155					160
Glu	Asp	Pro	Leu	Val	His	Asp	Arg	Ile	Ser	Ala	Lys	Leu	Gly	Arg	Ser
				165					170					175	
Ile	Phe	Val	Asn	Met	Glu	Leu	Ala	His	Arg	Glu	Ala	Asp	Lys	Ile	Lys
			180					185					190		
Val	Pro	Ile	Leu	Leu	Leu	Ile	Gly	Thr	Gly	Asp	Val	Ile	Thr	Pro	Pro
			195				200					205			
Glu	Gly	Ser	Arg	Arg	Leu	Phe	Glu	Glu	Leu	Ala	Val	Glu	Asn	Lys	Thr
			210			215					220				
Leu	Arg	Glu	Phe	Glu	Gly	Ala	Tyr	His	Glu	Ile	Phe	Glu	Asp	Pro	Glu
225					230					235					240
Trp	Ala	Glu	Glu	Phe	His	Glu	Thr	Ile	Val	Lys	Trp	Leu	Val	Glu	Lys
				245					250					255	
Ser	Tyr	Ser	Ser	Ala	Gln										
				260											
<210> 39															
<211> 249															
<212> PRT															
<213> Aquifex VF5-34LC															
<400> 39															
Leu	Ile	Gly	Asn	Leu	Lys	Leu	Lys	Arg	Phe	Glu	Glu	Val	Asn	Leu	Val
1				5					10					15	
Leu	Ser	Gly	Gly	Ala	Ala	Lys	Gly	Ile	Ala	His	Ile	Gly	Val	Leu	Lys
			20					25					30		
Ala	Leu	Glu	Glu	Leu	Gly	Ile	Lys	Val	Lys	Arg	Leu	Ser	Gly	Val	Ser
			35				40						45		
Ala	Gly	Ala	Ile	Val	Ser	Val	Phe	Tyr	Ala	Ser	Gly	Tyr	Thr	Pro	Asp
			50			55					60				
Glu	Met	Leu	Lys	Leu	Leu	Lys	Glu	Val	Asn	Trp	Leu	Lys	Leu	Phe	Lys
65				70					75					80	
Phe	Lys	Thr	Pro	Lys	Met	Gly	Leu	Met	Gly	Trp	Glu	Lys	Ala	Ala	Glu
				85					90					95	
Phe	Leu	Glu	Lys	Glu	Leu	Gly	Val	Lys	Arg	Leu	Glu	Asp	Leu	Asn	Ile
			100					105					110		
Pro	Thr	Tyr	Leu	Cys	Ser	Ala	Asp	Leu	Tyr	Thr	Gly	Lys	Ala	Leu	Tyr
			115				120					125			
Phe	Gly	Arg	Gly	Asp	Leu	Ile	Pro	Val	Leu	Leu	Gly	Ser	Cys	Ser	Ile

130	135	140	
Pro Gly Ile Phe Glu	Pro Val Glu Tyr Glu	Asn Phe Leu Leu Val	Asp
145	150	155	160
Gly Gly Ile Val	Asn Asn Leu Pro Val	Glu Pro Leu Glu Lys	Phe Lys
	165	170	175
Glu Pro Ile Ile	Gly Val Asp Val	Leu Pro Ile Thr	Gln Glu Arg Lys
	180	185	190
Ile Lys Asn Ile	Leu His Ile Leu Ile	Arg Ser Phe Phe	Leu Ala Val
	195	200	205
Arg Ser Asn Ser	Glu Lys Arg Lys	Glu Phe Cys Asn	Val Val Ile Glu
	210	215	220
Pro Pro Leu Glu	Glu Glu Phe Ser	Pro Leu Asp Val	Asn Lys Ala Asp
	225	230	235
240			
Ile Phe Cys Gly	Asp Met Arg Ala	Leu	
	245		

<210> 40
 <211> 338
 <212> PRT
 <213> Teredinibacter - 42

<400> 40

Met Pro Ala Asn	Asp Ser Pro Thr	Ile Asp Phe Asn	Pro Arg Gly Ile
1	5	10	15
Leu Arg Asn Ala	His Ala Gln Val	Ile Leu Ala Thr	Ser Gly Leu Arg
	20	25	30
Lys Ala Phe Leu	Lys Arg Thr His	Lys Ser Tyr Leu	Ser Thr Ala Gln
	35	40	45
Trp Leu Glu Leu	Asp Ala Gly Asn	Gly Val Thr Leu	Ala Gly Glu Leu
	50	55	60
Asn Thr Ala Pro	Ala Thr Ala Ser	Ser Ser Ser His	Pro Ala His Lys
	65	70	75
80			
Thr Leu Val Ile	Val Leu His Gly	Trp Glu Gly Ser	Ser Gln Ser Ala
	85	90	95
Tyr Ala Thr Ser	Ala Gly Ser Thr	Leu Phe Asp Asn	Gly Phe Asp Thr
	100	105	110
Phe Arg Leu Asn	Phe Arg Asp His	Gly Asp Thr Tyr	His Leu Asn Arg
	115	120	125
Gly Ile Phe Asn	Ser Ser Leu Ile	Asp Glu Val Val	Gly Ala Val Lys
	130	135	140
Ala Ile Gln Gln	Gln Thr Asp Tyr	Asp Lys Tyr Cys	Leu Met Gly Phe
	145	150	155
160			
Ser Leu Gly Gly	Asn Phe Ala Leu	Arg Val Ala Val	Arg Glu Gln His

165								170				175			
Leu	Ala	Lys	Pro	Leu	Ala	Gly	Val	Leu	Ala	Val	Cys	Pro	Val	Leu	Asp
			180								185				190
Pro	Ala	His	Thr	Met	Met	Ala	Leu	Asn	Arg	Gly	Ala	Phe	Phe	Tyr	Gly
		195					200					205			
Arg	Tyr	Phe	Ala	His	Lys	Trp	Lys	Arg	Ser	Leu	Thr	Ala	Lys	Leu	Ala
	210					215					220				
Ala	Phe	Pro	Asp	Tyr	Lys	Tyr	Gly	Lys	Asp	Leu	Lys	Ser	Ile	His	Thr
225					230					235					240
Leu	Asp	Glu	Leu	Asn	Asn	Tyr	Phe	Ile	Pro	Arg	Tyr	Thr	Gly	Phe	Asn
				245				250						255	
Ser	Val	Ser	Glu	Tyr	Phe	Lys	Ser	Tyr	Thr	Leu	Thr	Gly	Gln	Lys	Leu
			260				265					270			
Ala	Phe	Leu	Asn	Cys	Pro	Ser	Tyr	Ile	Leu	Ala	Ala	Gly	Asp	Asp	Pro
		275					280					285			
Ile	Ile	Pro	Ala	Ser	Asp	Phe	Gln	Lys	Ile	Ala	Lys	Pro	Ala	Asn	Leu
	290					295					300				
His	Ile	Thr	Val	Thr	Gln	Gln	Gly	Ser	His	Cys	Ala	Tyr	Leu	Glu	Asn
305					310					315					320
Leu	His	Lys	Pro	Ser	Ala	Ala	Asp	Lys	Tyr	Ala	Val	Lys	Leu	Phe	Gly
				325				330						335	

Ala Cys

<210> 41
 <211> 311
 <212> PRT
 <213> Archaeoglobus fulgidus

<400> 41

Met	Leu	Asp	Met	Pro	Ile	Asp	Pro	Val	Tyr	Tyr	Gln	Leu	Ala	Glu	Tyr
1				5				10						15	
Phe	Asp	Ser	Leu	Pro	Lys	Phe	Asp	Gln	Phe	Ser	Ser	Ala	Arg	Glu	Tyr
			20					25					30		
Arg	Glu	Ala	Ile	Asn	Arg	Ile	Tyr	Glu	Glu	Arg	Asn	Arg	Gln	Leu	Ser
		35					40					45			
Gln	His	Glu	Arg	Val	Glu	Arg	Val	Glu	Asp	Arg	Thr	Ile	Lys	Gly	Arg
	50					55				60					
Asn	Gly	Asp	Ile	Arg	Val	Arg	Val	Tyr	Gln	Gln	Lys	Pro	Asp	Ser	Pro
65					70					75					80
Val	Leu	Val	Tyr	Tyr	His	Gly	Gly	Gly	Phe	Val	Ile	Cys	Ser	Ile	Glu
				85				90						95	
Ser	His	Asp	Ala	Leu	Cys	Arg	Arg	Ile	Ala	Arg	Leu	Ser	Asn	Ser	Thr

100					105					110					
Val	Val	Ser	Val	Asp	Tyr	Arg	Leu	Ala	Pro	Glu	His	Lys	Phe	Pro	Ala
		115					120					125			
Ala	Val	Tyr	Asp	Cys	Tyr	Asp	Ala	Thr	Lys	Trp	Val	Ala	Glu	Asn	Ala
	130					135					140				
Glu	Glu	Leu	Arg	Ile	Asp	Pro	Ser	Lys	Ile	Phe	Val	Gly	Gly	Asp	Ser
145					150					155					160
Ala	Gly	Gly	Asn	Leu	Ala	Ala	Ala	Val	Ser	Ile	Met	Ala	Arg	Asp	Ser
			165						170					175	
Gly	Glu	Asp	Phe	Ile	Lys	His	Gln	Ile	Leu	Ile	Tyr	Pro	Val	Val	Asn
		180						185					190		
Phe	Val	Ala	Pro	Thr	Pro	Ser	Leu	Leu	Glu	Phe	Gly	Glu	Gly	Leu	Trp
	195						200					205			
Ile	Leu	Asp	Gln	Lys	Ile	Met	Ser	Trp	Phe	Ser	Glu	Gln	Tyr	Phe	Ser
	210					215					220				
Arg	Glu	Glu	Asp	Lys	Phe	Asn	Pro	Leu	Ala	Ser	Val	Ile	Phe	Ala	Asp
225					230					235					240
Leu	Glu	Asn	Leu	Pro	Pro	Ala	Leu	Ile	Ile	Thr	Ala	Glu	Tyr	Asp	Pro
			245					250						255	
Leu	Arg	Asp	Glu	Gly	Glu	Val	Phe	Gly	Gln	Met	Leu	Arg	Arg	Ala	Gly
		260						265					270		
Val	Glu	Ala	Ser	Ile	Val	Arg	Tyr	Arg	Gly	Val	Leu	His	Gly	Phe	Ile
		275					280					285			
Asn	Tyr	Tyr	Pro	Val	Leu	Lys	Ala	Ala	Arg	Asp	Ala	Ile	Asn	Gln	Ile
	290					295					300				
Ala	Ala	Leu	Leu	Val	Phe	Asp									
305					310										

<210> 42
 <211> 305
 <212> PRT
 <213> Sulfolobus solfataricus

<400> 42

Met	Pro	Leu	Asp	Pro	Arg	Ile	Lys	Lys	Leu	Leu	Glu	Ser	Ala	Leu	Thr
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Ile	Pro	Ile	Gly	Lys	Ala	Pro	Val	Glu	Glu	Val	Arg	Lys	Ile	Phe	Arg
		20						25					30		
Gln	Leu	Ala	Ser	Ala	Ala	Pro	Lys	Val	Glu	Val	Gly	Lys	Val	Glu	Asp
	35						40					45			
Ile	Lys	Ile	Pro	Gly	Ser	Glu	Thr	Val	Ile	Asn	Ala	Arg	Val	Tyr	Phe
	50					55					60				
Pro	Lys	Ser	Ser	Gly	Pro	Tyr	Gly	Val	Leu	Val	Tyr	Leu	His	Gly	Gly

65		70		75		80
Gly Phe Val Ile	Gly Asp Val Glu Ser Tyr Asp Pro Leu Cys Arg Ala					
	85		90			95
Ile Thr Asn Ala Cys Asn Cys Val Val Val Ser Val Asp Tyr Arg Leu						
	100		105			110
Ala Pro Glu Tyr Lys Phe Pro Ser Ala Val Ile Asp Ser Phe Asp Ala						
	115		120			125
Thr Asn Trp Val Tyr Asn Asn Leu Asp Lys Phe Asp Gly Lys Met Gly						
	130		135			140
Val Ala Ile Ala Gly Asp Ser Ala Gly Gly Asn Leu Ala Ala Val Val						
	145		150			155
						160
Ala Leu Leu Ser Lys Gly Lys Ile Asn Leu Lys Tyr Gln Ile Leu Val						
			165			170
						175
Tyr Pro Ala Val Ser Leu Asp Asn Val Ser Arg Ser Met Ile Glu Tyr						
			180			185
						190
Ser Asp Gly Phe Phe Leu Thr Arg Glu His Ile Glu Trp Phe Gly Ser						
			195			200
						205
Gln Tyr Leu Arg Ser Pro Ala Asp Leu Leu Asp Phe Arg Phe Ser Pro						
			210			215
						220
Ile Leu Ala Gln Asp Phe Asn Gly Leu Pro Pro Ala Leu Ile Ile Thr						
			225			230
						235
Ala Glu Tyr Asp Pro Leu Arg Asp Gln Gly Glu Ala Tyr Ala Asn Lys						
			245			250
						255
Leu Leu Gln Ala Gly Val Ser Val Thr Ser Val Arg Phe Asn Asn Val						
			260			265
						270
Ile His Gly Phe Leu Ser Phe Phe Pro Leu Met Glu Gln Gly Arg Asp						
			275			280
						285
Ala Ile Gly Leu Ile Gly Ser Val Leu Arg Arg Val Phe Tyr Asp Lys						
			290			295
						300
Ile						
305						